Jan. 10, 1928. 1,655,549

E. ISCHINGER

GUARD FOR PUNCH PRESSES

Filed June 25, 1926 3 Sheets-Sheet 1

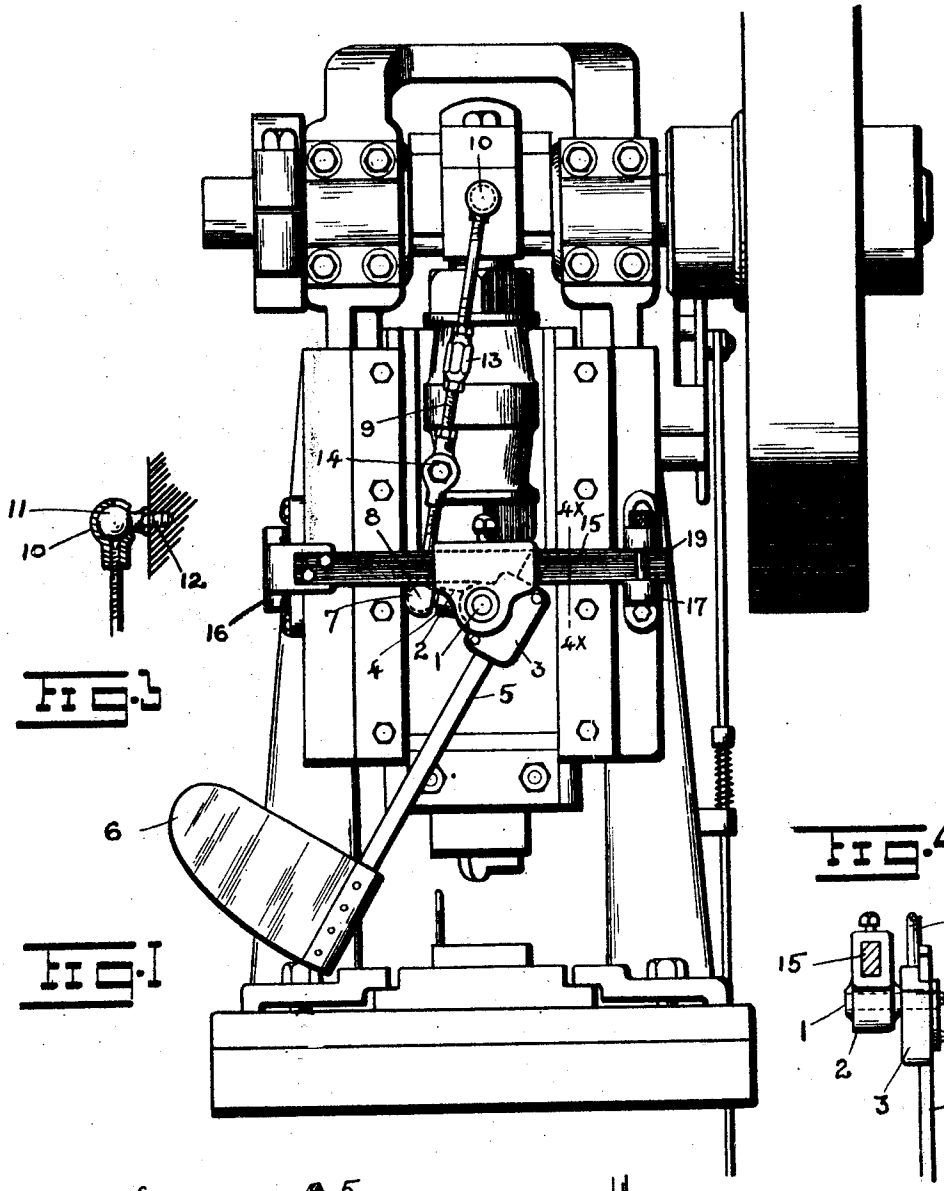



FIG. 3

FIG. 1




FIG. 4

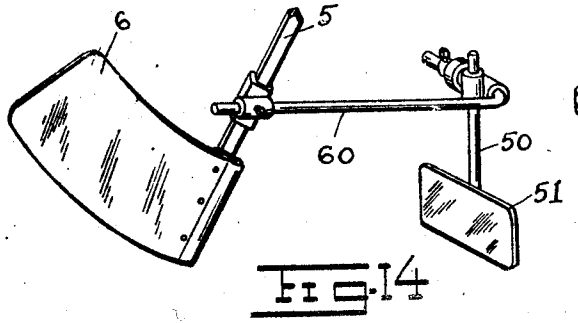



FIG. 14




FIG. 2

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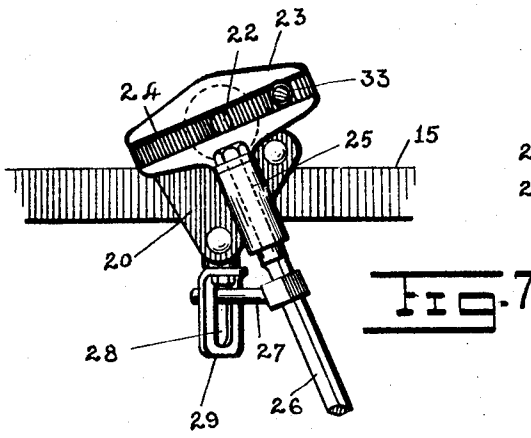



Fig. 7

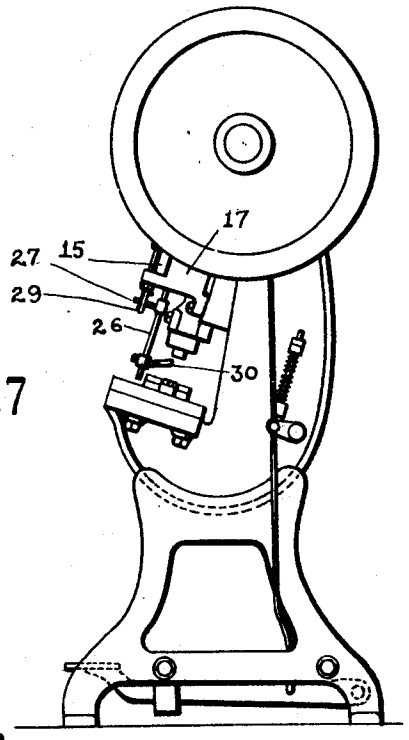



Fig. 6

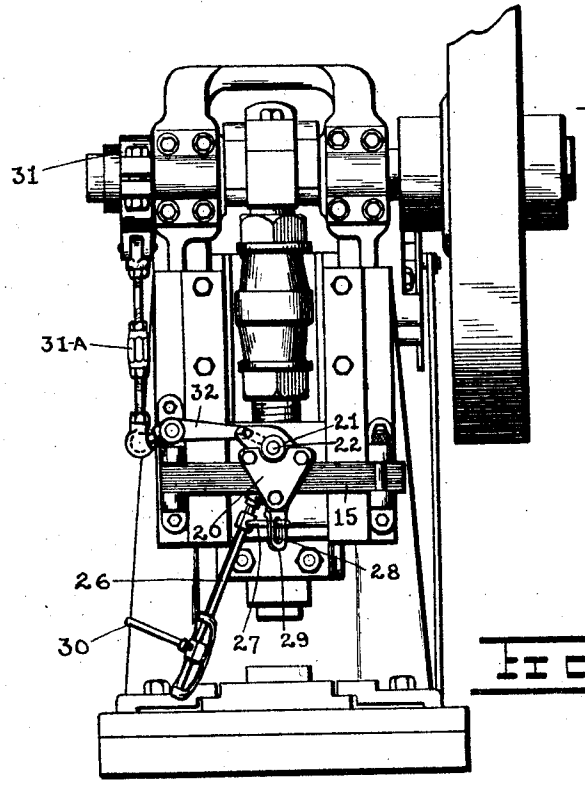



Fig. 5

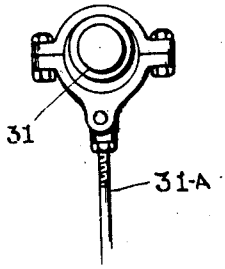



Fig. 8

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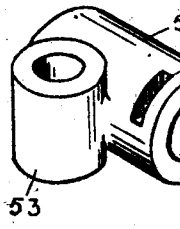



Fig. 11

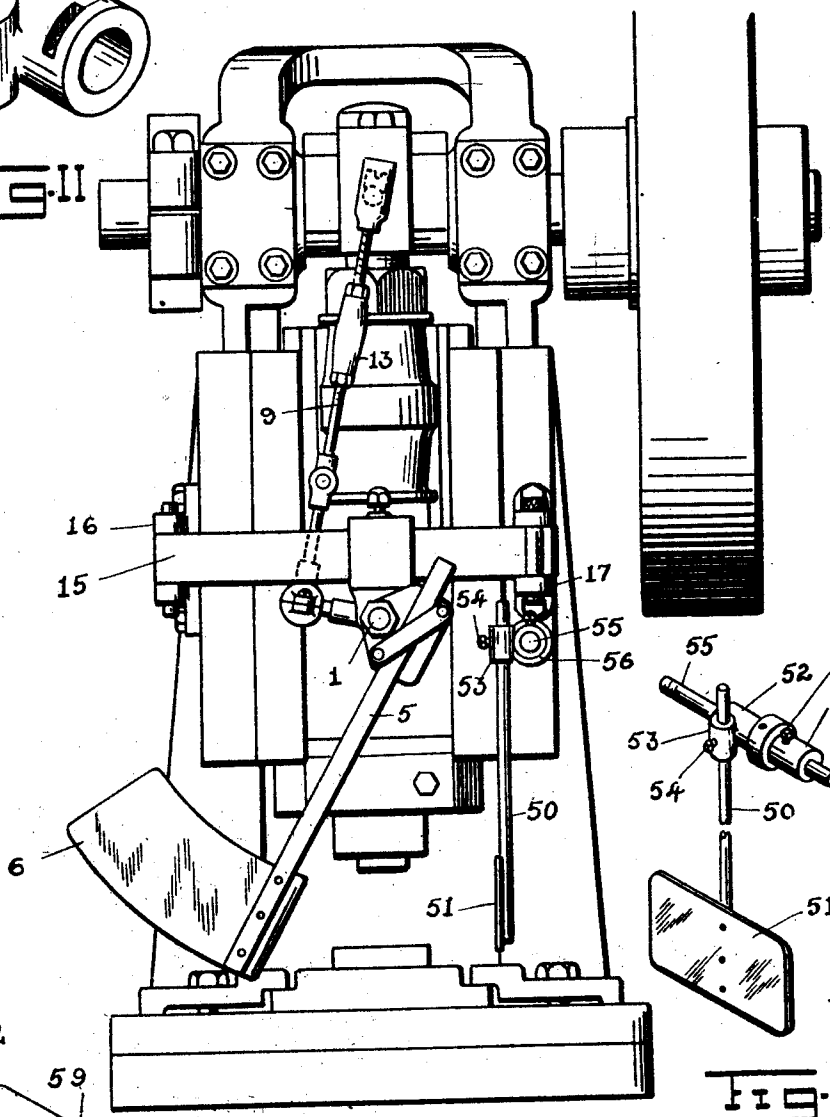



Fig. 9




Fig. 10

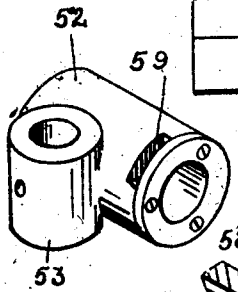



Fig. 12

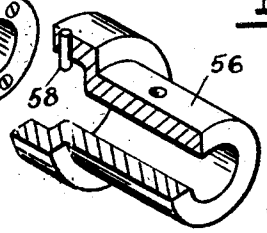



Fig. 13

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Patented Jan. 10, 1928. 1,655,549

# UNITED STATES PATENT OFFICE.

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## GUARD FOR PUNCH PRESSES.

Application filed June 25, 1926. Serial No. 118,523.

This application is a continuation in part of my application No. 346,621 filed December 21, 1919, on guard for punch presses and the invention disclosed therein shows a simplified modification of the guard of the prior application and its object is to provide a guard that is solely operated from the moving member of the press at each reciprocation thereof.

This and other objects of this invention will be fully illustrated in the drawings, described in the specification and pointed out in the claim at the end thereof.

In the accompanying drawings:

Figure 1 is a front elevation of a punch press with the simplified form of guard mounted thereon.

Figure 2 is a side elevation of a portion of the connecting link connecting the guard with the moving member of the press.

Figure 3 is a sectional view of the ball connection between the link and the moving member of the press.

Figure 4 is a sectional detail view of a portion of the guard and its mounting, the section being taken on the line $4^{\times}$—$4^{\times}$ of Figure 1.

Figure 5 is a front elevation of a punch press having a modified form of the guard mounted thereon.

Figure 6 is a side elevation of the punch press provided with the guard.

Figure 7 is a rear elevation and detail view of the operating members of the safety guard.

Figure 8 is a side elevation of the eccentric provided for operating the guard illustrated in Figures 5 and 6.

Figure 9 is a front elevation of a modified form of the guard illustrated in Figure 1.

Figure 10 is a perspective view of an auxiliary guard member used in connection with the pendulum guard.

Figure 11 is a detail perspective view of the oscillating member of the auxiliary guard illustrated in Figure 10.

Figure 12 is a detail perspective view of a modified form of the oscillating member for the auxiliary guard illustrated in Figure 10.

Figure 13 is a partial detail perspective and sectional view of the locating sleeve for the auxiliary guard illustrated in Figure 10.

Figure 14 is a detail perspective view of the guard arm with an auxiliary guard attached thereto.

In the several figures of the drawings like reference numerals indicate like parts.

In a guard for punch presses of the pendulum or sweep guard type it is desirable to make its mechanism and connection with the moving member of the press as simple as possible so as not to obstruct the adjustable parts of the press. For this reason the guard forming the subject matter of this invention comprises an oscillating member that is suitably mounted on the frame of the press and is operated from the moving member thereof by being permanently but adjustably connected thereto.

As illustrated in Figure 1 the guard is mounted to oscillate on the pivot pin 1 carried by the pivot head 2. A guard head or oscillating member 3 having a crank 4 projecting from one side thereof is pivoted on this pivot pin 1. The guard head 3 has also the guard arm 5 clamped thereto which carries at its lower end the vane or guard wing 6. The crank 4 is provided at its outer end with the ball member 7 to which is connected the ball socket 8 provided on the lower end of the link 9. The upper end of this link is provided with a similar ball socket 10 that engages the ball member 11 carried on the outer end of the stud 12. The connecting link 9 is made up in sections that are connected together with the turn buckle 13 and the ratchet face joint 14. The turn buckle is provided to either lengthen or shorten the link and the ratchet face joint is provided to change the straight line connection into an angular connection should it be found necessary to do so.

The pivot head 2 is mounted on the bridge 15 being adjustable back and forth thereon to position the pivot pin 1 and guard head 3 at the most advantageous position in front of the frame and ram of the press. The bridge 15 is supported by two brackets 16 and 17 that are suitably fastened to the frame of the press one at each side of the ram of the press. The bridge 15 is hinged at one end to the bracket 16 while its other end is locked to the bracket 17 being held in place in the bifurcated outer end of the bracket by means of the locking pin 19 which

passes thru the bifurcated ends of the bracket 17 in front of the end of the bridge supported therein.

On the reciprocation of the ram of the press, the connecting rod head, by which the ram is driven, swings thru a complete revolution for each reciprocation. The connecting link connecting the connecting rod head of the press with the crank 4 of the guard head 3 oscillates the guard head and as the guard head carries the arm and vane or gate, these members are swung from one side to the other of the ram and back again at each revolution of the connecting rod head.

In this way the guard operates with each stroke of the press and brushes the operator's hand aside from directly in front of the ram of the press should it be in this dangerous position when the ram descends.

It sometimes happens that careless operators try to avoid coming in contact with the guard arm by reaching around it while it swings from one side of the ram to the other and back again. The guard above described will, of course, be of little value to the operator who deliberately tries to beat it and exposes himself to danger in consequence thereof.

For this reason the guard may be provided with an additional guard member that simultaneously sweeps over the die and below the ram while the guard arm sweeps past the ram in front of it. In this way the hand of the operator who reaches around the guard arm will come in contact with the horizontally swinging guard member that sweeps over the die and his hand is brushed away by this guard member whether the guard arm comes in contact with his hand or not.

The additional guard member consists of a rearwardly projecting guard member that is attached to the guard arm so that both the guard arm and the additional guard member operate simultaneously at each operation of the press.

As illustrated in Figures 5 to 8 inclusive of the drawings the guard is mounted on the bridge supported by the hinge and lock brackets. On the bridge is carried the pivot block 20 having a bearing 21 formed at the top thereof in which the pivot pin 22 is mounted to oscillate. The pivot pin 22 carries on its inner end the cam head 23 thru which the pendulum guard proper is operated. This cam head is formed in the shape of a T member having a cam slot 24 formed therein on the inner face thereof. The shank 25 of the cam head 23 is formed by a sleeve in which the upper end of the pendulum guard member 26 is mounted to turn.

The guard member 26 has a link 27 fastened to it. This link projects from the guard member 26 toward the bottom of the pivot block where it projects into the vertical slot 28 provided in the guide member 29. This guide member is made up in the form of an angle bracket of which the horizontal portion is mounted to turn in a suitable pivot pin carried on the lower end of the pivot block 20.

Near the lower end of the guard member 26 is fastened the auxiliary guard member 30. This auxiliary guard member is adjustably fastened to the shank of the guard member 26 by means of a set screw and can be fastened to it at any desired elevation thereon. The governing factor of the location of the auxiliary member 30 on the guard member 26 is the height of the die that is mounted on the bed plate of the punch press. The function of the auxiliary member 30 is to sweep over the top of this die and brush aside the hand or fingers of the operator that may be placed on the die at the beginning of the operation of the press. In order to make the auxiliary member 30 perform this function properly it must be set so as to pass between the punch and the die before they close to do their work.

The guard member 26 is operated by the crank shaft of the press. For this purpose an eccentric 31 is keyed to the end of the crankshaft. This eccentric in turn is connected thru the eccentric rod 31A to the lever 32. The cam roller 33 is adapted to engage into the cam slot 24 of the cam head so that on the reciprocation of the ram the cam head is oscillated with the pivot pin 32 in the bearing of the pivot block 20. This movement of the head 23 operates to swing the guard member 26 across the front of the punch and die in the manner of a pendulum and sweeps the arm or hand of the operator away from in front of the die should it be held there during the downward stroke of the ram.

At the same time the guard member 26 sweeps in front of the die, the auxiliary member 30 sweeps over the top of the die. This is caused by the engagement of the link 27 with the slotted guide bracket 29. The link or arm 27 by reason of its engagement with the slot 28 of the guide 29 begins to turn the guard member 26 in the sleeve forming the shank 25 of the cam head 23 as soon as the guard member 26 starts to swing from the left to the right of the die. This is due to the fact that the outer end of the link or arm 27 is held stationary and swivels with the guide member while the inner end that is fastened to the guard member 26 swings from one side of the pivot block to the other side thereof. The guard member 26 is thus turned in the cam head during its pendulum motion and this turning of the guard member operates to turn the auxiliary member so that as the guard member 26 sweeps in front of the die, the auxiliary guard member sweeps over the top

of it just before the punch carried by the ram comes in contact with it.

It is believed that this double movement of the guard in front and over the top of the die will prevent any possible injury to the operator of the press.

The guard illustrated in Figure 9 is with some modifications the same as the guard illustrated in Figure 1 except that an auxiliary guard is illustrated in connection therewith. This auxiliary guard comprises an arm 50 which carries at the lower end the wing or gate 51. The arm 50 is suspended from the oscillating member 52 and is adjustably held in place in the sleeve 53 forming part of the oscillating member. A set screw 54 is provided on the sleeve and serves to clamp the arm 50 in place therein.

The oscillating member 52 is mounted to oscillate on the stud 55 which is provided with a thread at one end with which it engages the frame of the press at one side of the ram thereof. The oscillating member 52 is held against endwise movement on the stud 55 by means of the locating sleeve 56. This sleeve is held to the stud by means of the set screw 57 and may be adjustably fastened at any desired point on the stud. The sleeve 56 is enlarged at one end and this enlarged portion engages over one end of the oscillating member 52. In the periphery of the oscillating member is provided a segmental slot 59 into which engages the pin 58 carried by the sleeve 56 and projecting into the enlarged end thereof. The engagement of this pin with the slot 59 holds the oscillating member 52 and sleeve 56 together but permits the oscillating member 52 to oscillate or rock on the stud 55 independently of the sleeve 56. This oscillating or rocking motion is limited by the length of the slot 59. The sleeve 56 is fastened to the stud 55 so that the pin 58 holds the oscillating member against rotation in one direction. In this way the arm 50 with its wing or gate 51 can be held in an initial position. This may be a perfectly perpendicular position as illustrated in Figure 1 or may be an angular position. In either case, however, the engagement of the pin with the end of the slot will prevent the oscillating member to rotate in a clockwise direction that would allow the arm to swing toward the punch and die mounted in the press. The pin, however, will allow the arm to swing away from the die so that in case the operator's arm is placed between the die and the wing of the auxiliary guard the sweep of the guard in front of the ram can force the arm or hand away without being obstructed by the auxiliary guard.

The auxiliary guard prevents the operator from reaching around or behind the main guard as it forms an effective gate on the side of the die that obstructs access to the die from that side and makes it necessary to feed the die from the front.

I claim:

A guard for punch presses, the combination of a pivot member adapted to be mounted on the frame of the punch press, an oscillating member mounted on said pivot member, an arm provided on said oscillating member, a guard carried by said oscillating member, a rotating member on said press and a link connecting said arm with the rotating member of the punch press, a ball joint between said link and the rotating member of said press to form a universal connection between said arm and the rotating member of said punch press.

In testimony whereof I affix my signature.

ERIC ISCHINGER.